GE Technology Park
Traffic Impact Study

May 2008

Prepared for

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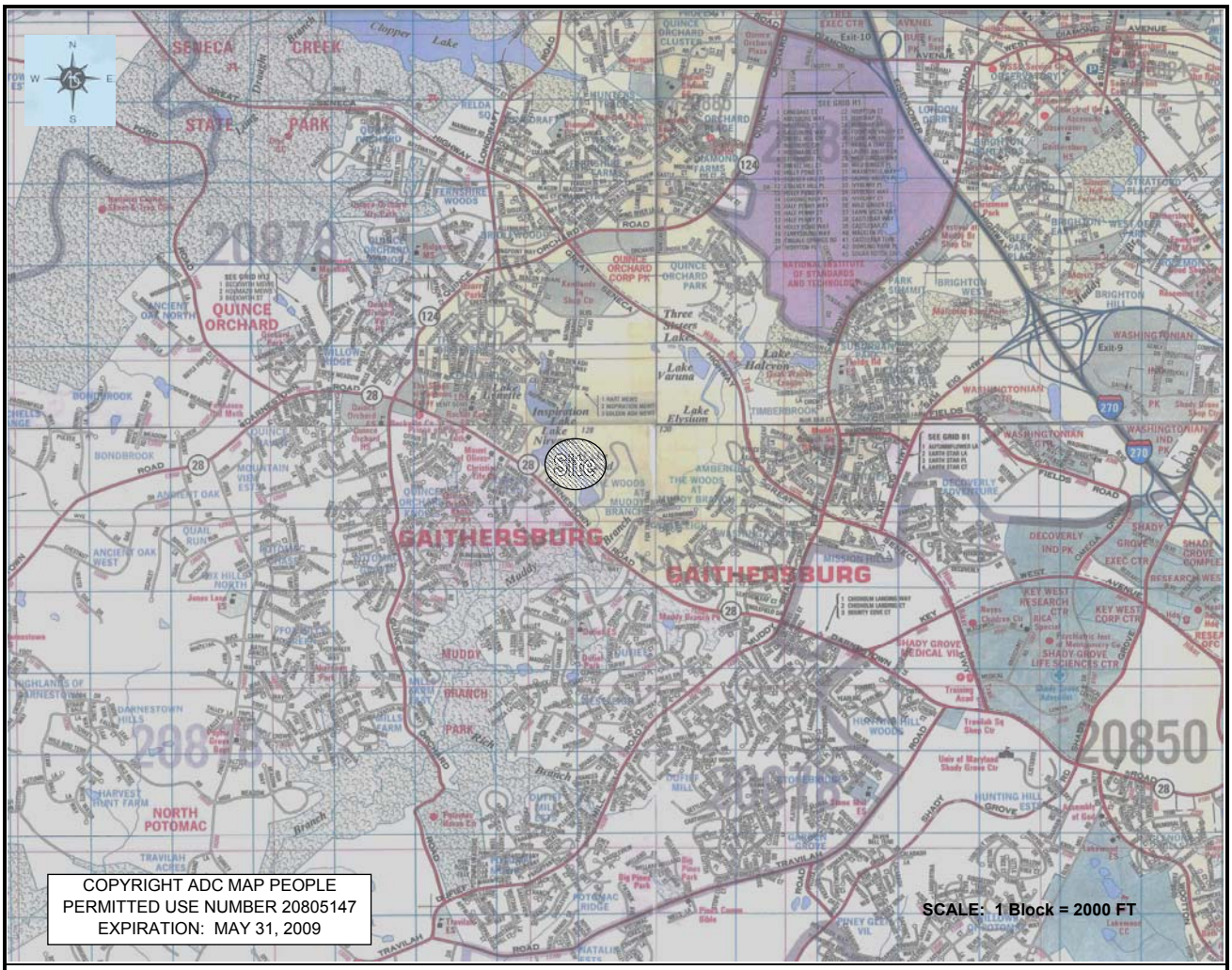
I. Introduction

This report contains the data, analysis, findings, and conclusions of a Traffic Impact Study for the proposed move of several Montgomery County agencies to the GE Technology Park. As shown in Figure 1, the site is located along MD 28 (Darnestown Road) in Gaithersburg, Maryland. The existing site contains 408,000 gross square feet of office space in the GE Building and approximately 260,000 square feet of warehouse space on the FINMARC Site. Montgomery County's proposed site use includes office space for Police Administration, Fire Administration, Homeland Security, and the 1st District Police Station, as well as use of the warehouse by the Department of Liquor Control. For comparison purposes, a second proposed site use known as the "Highest and Best" Use is considered in this study. The "Highest and Best" Use consists of full utilization of the existing office and warehouse facilities, and an additional 200,000 square feet of new office space.

This study has been conducted in accordance with the standards set forth in the Maryland-National Capital Park and Planning Commission's (MNCPPC) Local Area Transportation Review (LATR) Guidelines and the City of Gaithersburg's Traffic Impact Study Standards and Regulations. The study utilizes traffic counts, background development, and other information from the "GE Tech Park—Lot 1, Block 1 LATR Traffic Impact Analysis" dated June 4, 2007. This report includes a full assessment of Existing, Background, and two Proposed Conditions at six intersections along MD 28 based on ***Highway Capacity Manual (HCM)*** methodologies. Additionally, the study includes an analysis and comparison of truck traffic to and from the warehouse for the Existing and two Proposed Conditions.



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GE Technology Park

Figure 1

Location Map

II. Existing Condition Operations and Capacity Analysis

The current GE Building is only 30 percent occupied. The warehouse space on the FINMARC Site is approximately 90 percent occupied. When the "GE Tech Park—Lot 1, Block 1 LATR Traffic Impact Analysis" was conducted in June, 2007 there was approximately 135,000 SF (about 32 percent of the gross SF) of occupied office space in the GE Building. Since the occupancy rate has not changed from when that analysis was conducted, it can be concluded that today's volumes entering and exiting the GE Technology Park are the same as those presented in the previous study. In order to verify that the volumes shown in the June, 2007 report have not significantly changed, peak hour traffic counts were conducted at three locations within the GE Technology Park. Based on these traffic counts it was determined that today's volumes at the two site access points are similar to the volumes from the previous study. Therefore, volumes from the previous study were used in the Existing Conditions analysis and are shown on Figure 2. Existing counts and capacity analysis worksheets can be found in Appendix A.

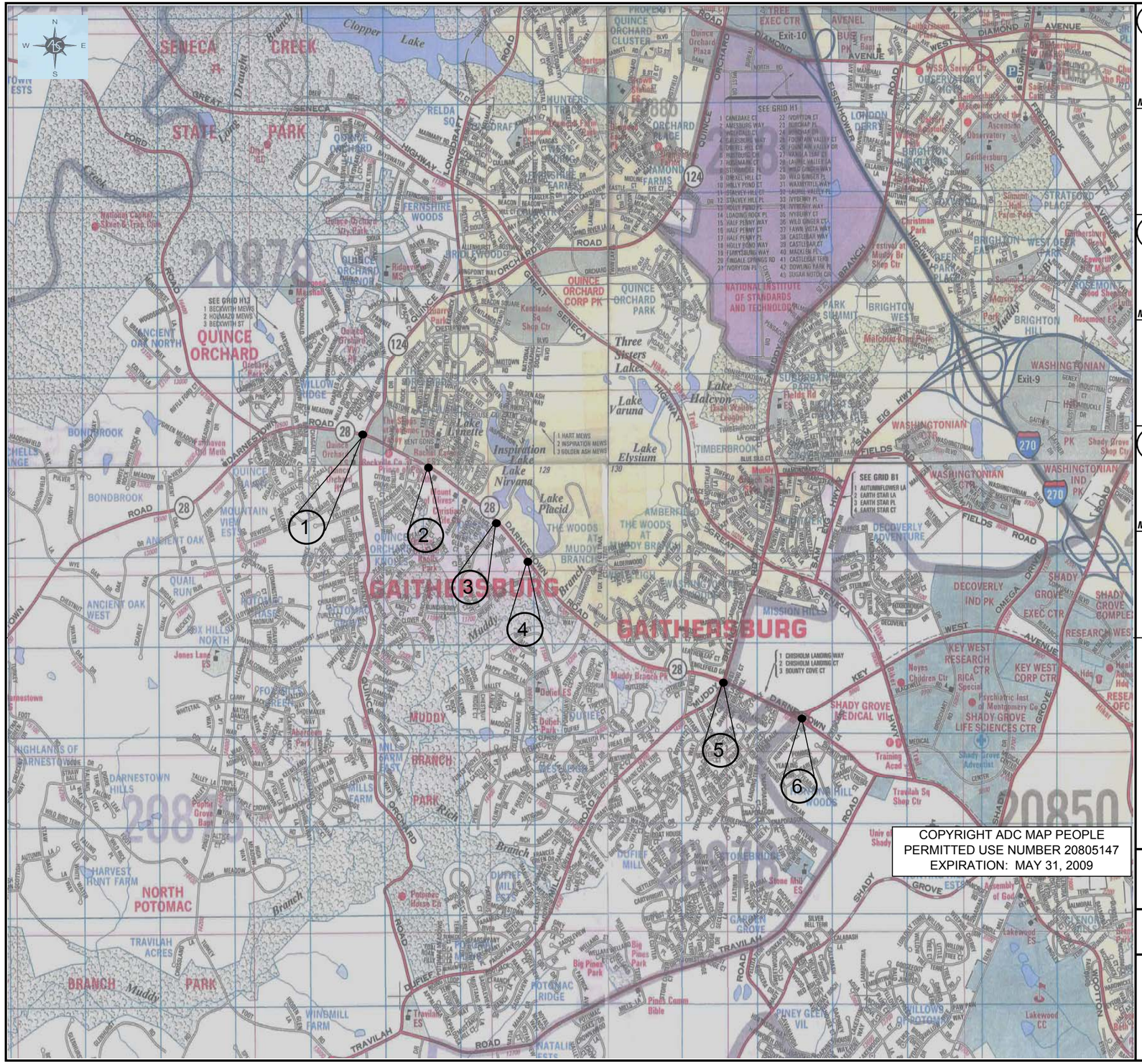
Intersection capacity analyses were conducted using both the Critical Lane Volume (CLV) approach and Synchro. Synchro models operations at signalized and unsignalized intersections using the methodology from the 2000 ***Highway Capacity Manual*** and records a variety of measures of effectiveness (MOEs). The MOEs utilized as part of this evaluation included LOS, stopped delay, and volume-to-capacity ratio. The CLV approach provides another method for calculating the level of congestion at an intersection. According to the LATR and the City of Gaithersburg, a CLV greater than 1450 requires mitigation. Table 1 below summarizes the results of the Existing Condition intersection capacity analyses.

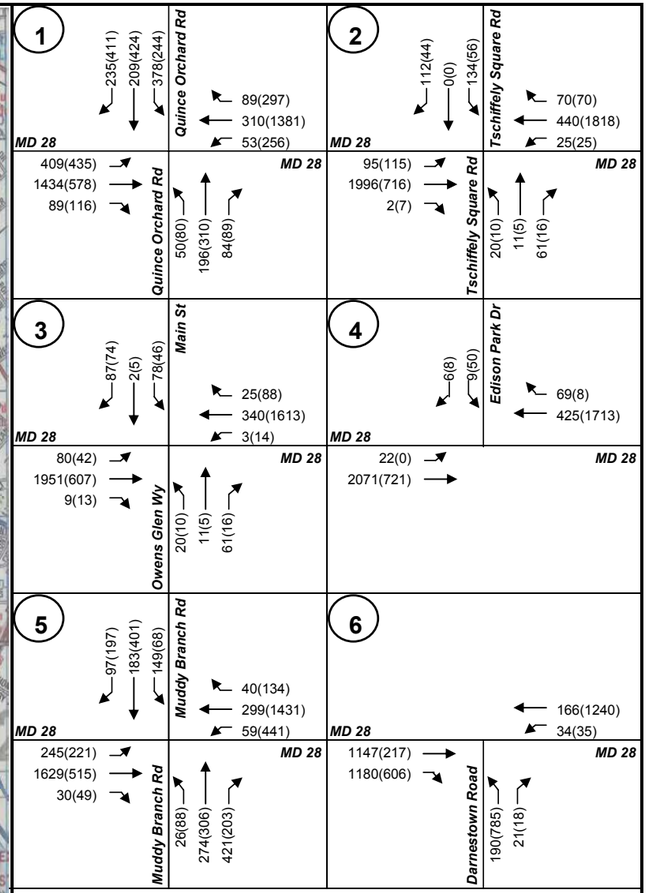
Table 1: Existing Intersection Capacity Analysis

	AM Peak Hour Synchro				PM Peak Hour Synchro			
MD 28 at	Delay (sec/veh)	v/c	LOS	CLV	Delay (sec/veh)	v/c	LOS	CLV
Quince Orchard Road	**59.6**	0.87	**E**	1,096	**61.0**	0.90	**E**	1,354
Tschiffely Square Road	19.1	0.82	B	1,248	12.3	0.70	B	1,150
Owens Glen Way/ Main Street	12.5	0.79	B	1,207	13.2	0.63	B	974
Edison Park Drive (Unsignalized)[1]	17.8	0.05	C	1,113	**87.3**	0.62	**F**	966
Muddy Branch Road	42.8	0.69	D	1,184	38.8	0.72	D	1,101
Darnestown Road	10.5	0.33	B	1,214	28.3	0.55	C	884

1- Delay, v/c, and LOS are reported for left-turns from the side street

It can be seen from the table above that MD 28 at Quince Orchard Road currently operates at a LOS E during both peak hours and the left-turns from Edison Park Drive currently operate at a LOS F during the PM peak hour. All intersections operate with an acceptable CLV less than the threshold of 1,450.





AM (PM) Peak Hour Traffic Volumes

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Figure 2

Existing AM and PM Peak Hour Traffic Volumes

III. Background Condition Operations and Capacity Analyses

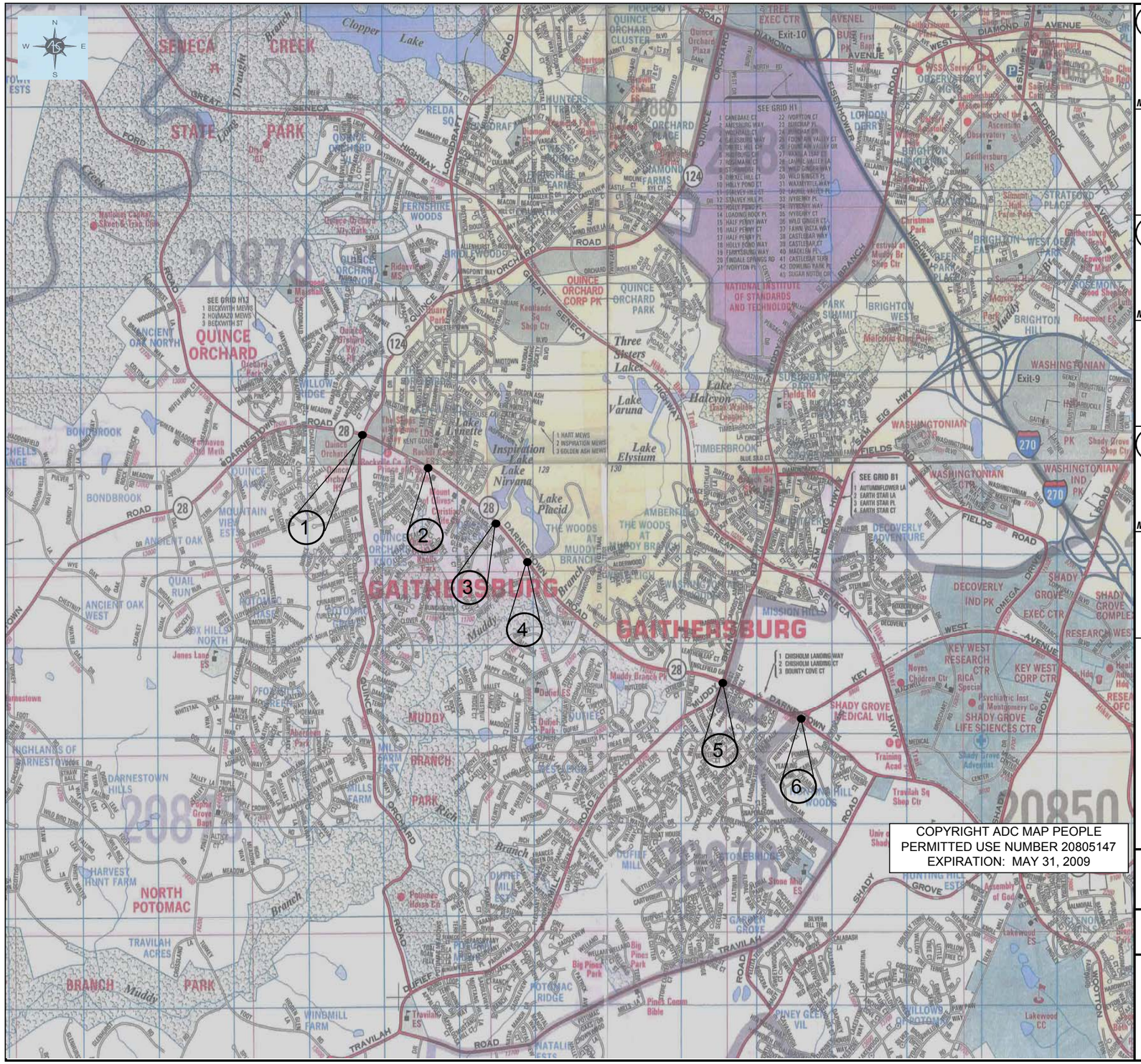
Background traffic volumes were taken from the "GE Tech Park—Lot 1, Block 1 LATR Traffic Impact Analysis". That analysis included 11 background developments, one of which was full utilization of the GE Building at the GE Technology Park site. The unused office space was included in the background development, rather than in the proposed development. Background trip generation and trip distribution information from that study is included in Appendix B. Background peak hour volumes are shown on Figure 3. Table 2 below summarizes the results of the Background Condition intersection capacity analyses.

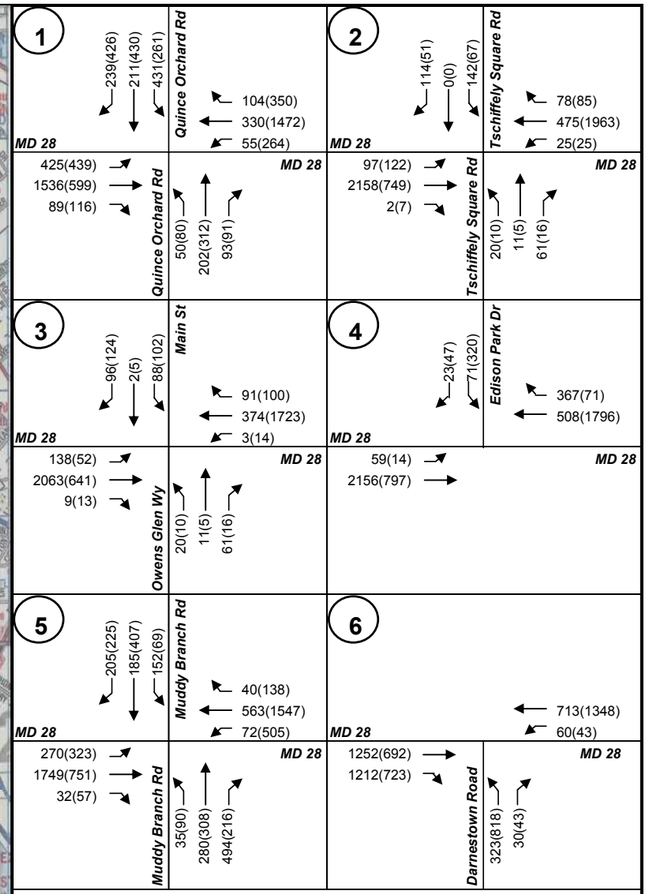
Table 2: Background Intersection Capacity Analysis

MD 28 at	AM Peak Hour Synchro				PM Peak Hour Synchro			
	Delay (sec/veh)	v/c	LOS	CLV	Delay (sec/veh)	v/c	LOS	CLV
Quince Orchard Road	**70.9**	0.94	**E**	1,174	**65.7**	0.95	**E**	1,414
Tschiffely Square Road	23.2	0.90	C	1,342	11.7	0.77	B	1,244
Owens Glen Way/ Main Street	13.0	0.85	D	1,276	22.2	0.76	C	1,098
Edison Park Drive (Unsignalized) [1]	**36.6**	0.48	**E**	1,237	**>999**	-	**F**	1,333
Muddy Branch Road	44.0	0.78	D	1,305	42.2	0.78	D	1,219
Darnestown Road	12.3	0.40	B	1,272	26.7	0.59	C	955

1- Delay, v/c, and LOS are reported for left-turns from the side street

It can be seen from the table above that MD 28 at Quince Orchard Road continues to operate at a LOS E during both peak hours. The left-turns from Edison Park Drive now operate at LOS E during the AM peak hour and LOS F during the PM peak hour with substantial delay. It should be noted that with the background traffic included, Edison Park Drive meets signal warrant criteria (see Section VII for details). All intersections operate with an acceptable CLV less than the threshold of 1,450.





AM (PM) Peak Hour Traffic Volumes

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GE Technology Park

Figure 3

Background AM and PM Peak Hour Traffic Volumes

IV. Future Condition 1 – Montgomery County Proposed Use – Operations and Capacity Analysis

Montgomery County's proposed use includes office space for Police Administration, Fire Administration, Homeland Security, and the 1st District Police Station. As per discussions with the County, these uses have been grouped as general office and are assumed to fully occupy the 408,000 SF of available office space in the GE Building. Because full occupancy of the general office space is assumed in the Background Condition, no new trips would be expected from this portion of the future site.

The County plans to utilize the warehouse space on the FINMARC Site for the Department of Liquor Control (DLC). They will conduct warehouse operations, as well as house administrative and training operations in this building. Trips for this portion of the future site were derived based on a survey completed by the DLC and specific information regarding user travel patterns provided by DLC officials. Trip generation results are shown in Table 3. It should be noted that training operations, which occur only twice per week, were included in the table. They comprise 170 of the daily trips in and out (85 in, 85 out) and 45 of the PM peak hour trips out (one of the classes typically ends at 5:00 PM). The number of future trips was then compared to the existing trips based on the 24 hour counts from the warehouse access driveway. The difference between the two comprises the total new trips generated by Future Condition 1. Trip distribution and assignment was based on regional trip tables from the LATR and figures from the "GE Tech Park—Lot 1, Block 1 LATR Traffic Impact Analysis" and can be found in Figure 4 and Appendix C. The DLC survey and notes from conversations with DLC officials can be found in Appendix C. Future Condition 1 (Montgomery County Proposed Use) volumes are shown in Figure 5. Table 4 below summarizes the results of the Future Condition 1 intersection capacity analyses.

Table 3: Trip Generation Table

	AM Peak Hour		PM Peak Hour		Daily	
	IN	OUT	IN	OUT	IN	OUT
Existing Warehouse[1]	70	30	61	85	656	709
Montgomery County Proposed Use[2]	101	39	53	142	372	372
Total New Trips Generated – Future 1	**31**	**9**	**(8)**	**57**	**(284)**	**(337)**

1- Based on traffic counts on warehouse access road
2- Based on DLC User Survey

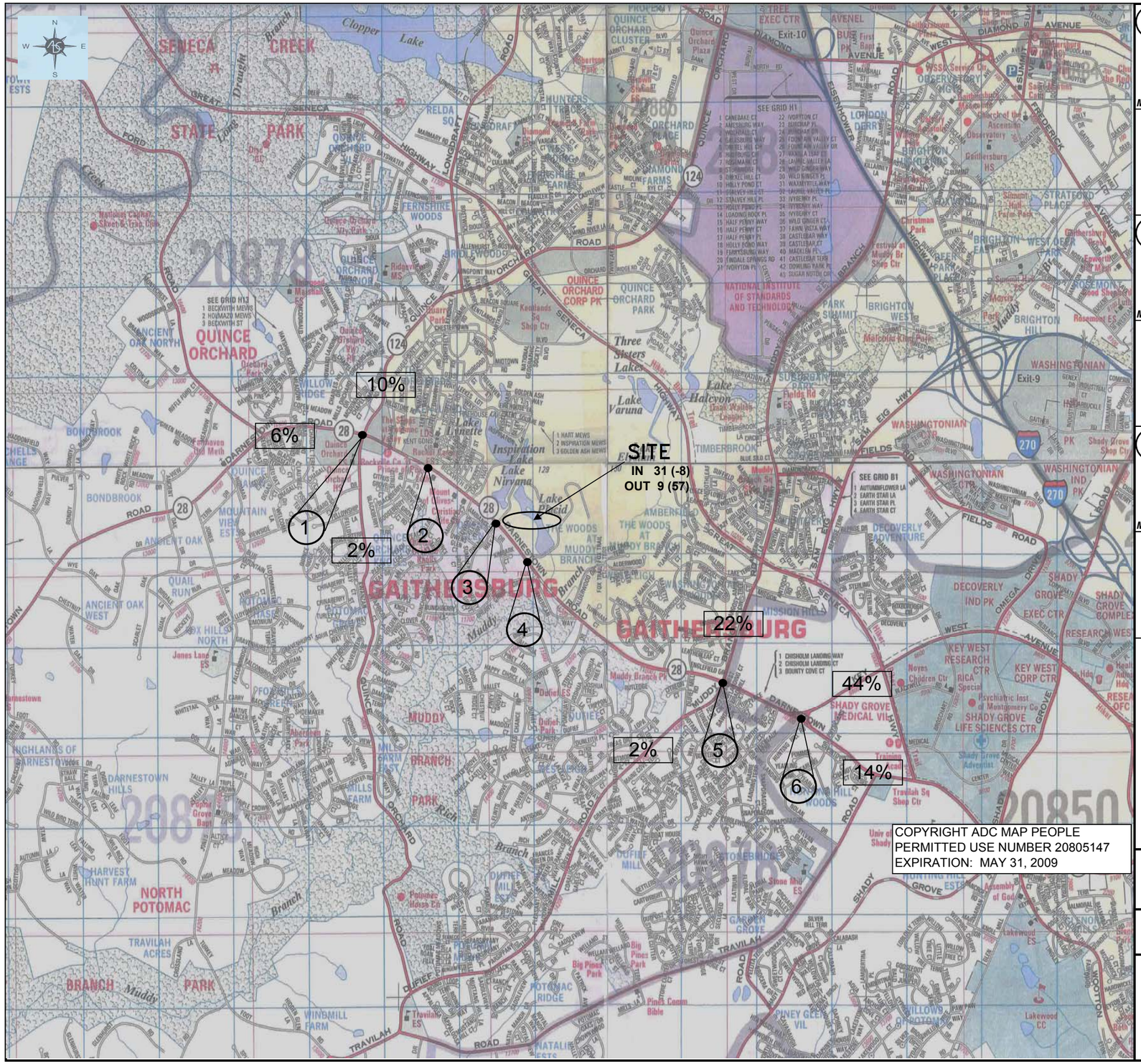
Table 3 indicates that during the AM peak hour there is a slight increase in warehouse trips compared to the existing use. During the PM peak hour there is a decrease in trips into the warehouse and an increase in trips out of the warehouse. Daily trips are reduced by more than 40 percent.

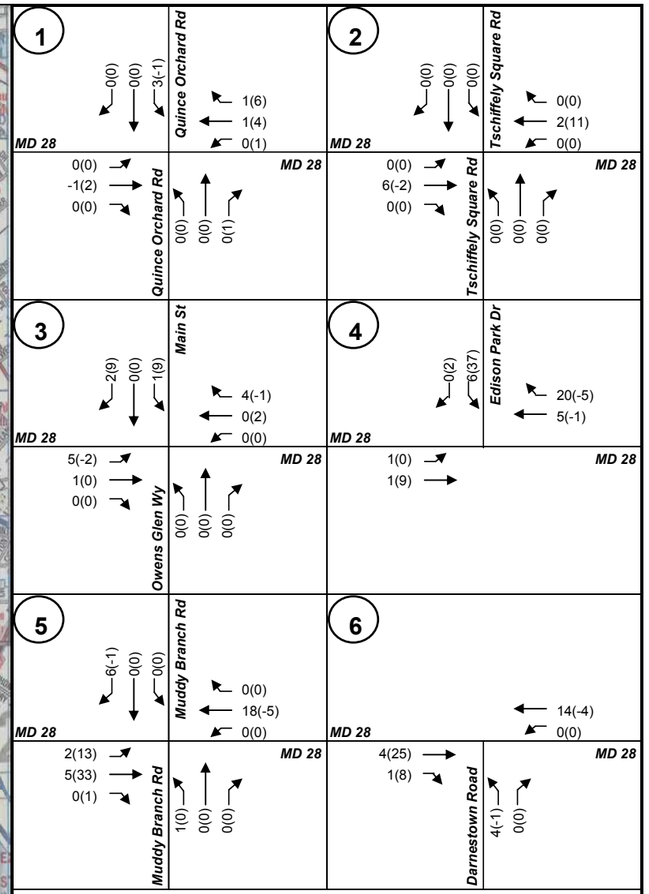
Table 4: Future 1 – County Proposed Use -- Intersection Capacity Analysis

MD 28 at	AM Peak Hour Synchro				PM Peak Hour Synchro			
	Delay (sec/veh)	v/c	LOS	CLV	Delay (sec/veh)	v/c	LOS	CLV
Quince Orchard Road	**71.7**	0.94	**E**	1,175	**65.8**	0.95	**E**	1,415
Tschiffely Square Road	28.3	0.92	C	1,398	11.3	0.78	B	1,250
Owens Glen Way/ Main Street	14.1	0.85	B	1,278	23.8	0.80	C	1,106
Edison Park Drive (Unsignalized) [1]	**39.4**	0.52	**E**	1,243	**>999**	-	**F**	1,371
Muddy Branch Road	44.1	0.78	D	1,307	42.5	0.78	D	1,224
Darnestown Road	12.4	0.40	B	1,273	26.8	0.59	C	953

1- Delay, v/c, and LOS are reported for left-turns from the side street

Under Montgomery County's proposed use there is almost no change from the background condition. The intersections of MD 28 at Quince Orchard Road and Edison Park Drive continue to operate at unacceptable levels of service, but there is a negligible impact to delay, v/c, LOS, and CLV.





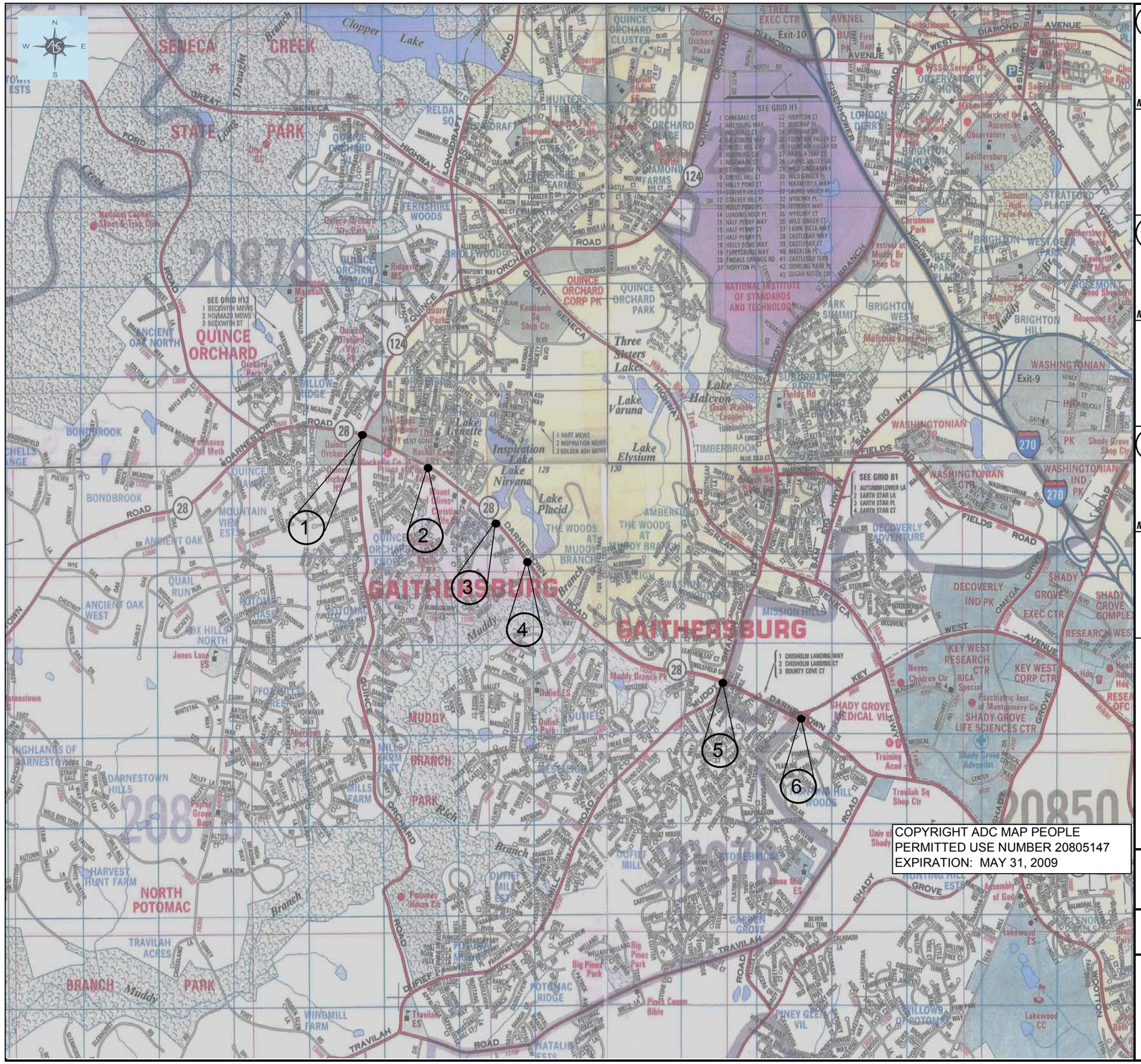
AM (PM) Peak Hour Traffic Volumes

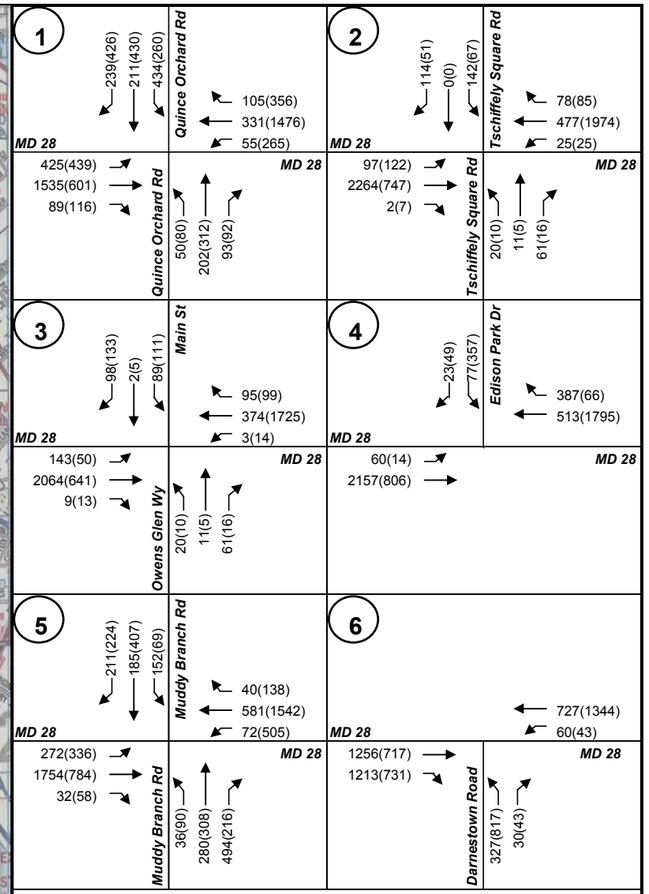
STV

GE Technology Park

Figure 4

Future 1 -- Montgomery County Proposed Use Trip Assignment
AM and PM Peak Hour Traffic Volumes





AM (PM) Peak Hour Traffic Volumes

STV

GE Technology Park

Figure 5

Future 1 -- Montgomery County Proposed Use AM and PM Peak Hour Traffic Volumes

V. Future 2 – "Highest and Best" Use – Operations and Capacity Analysis

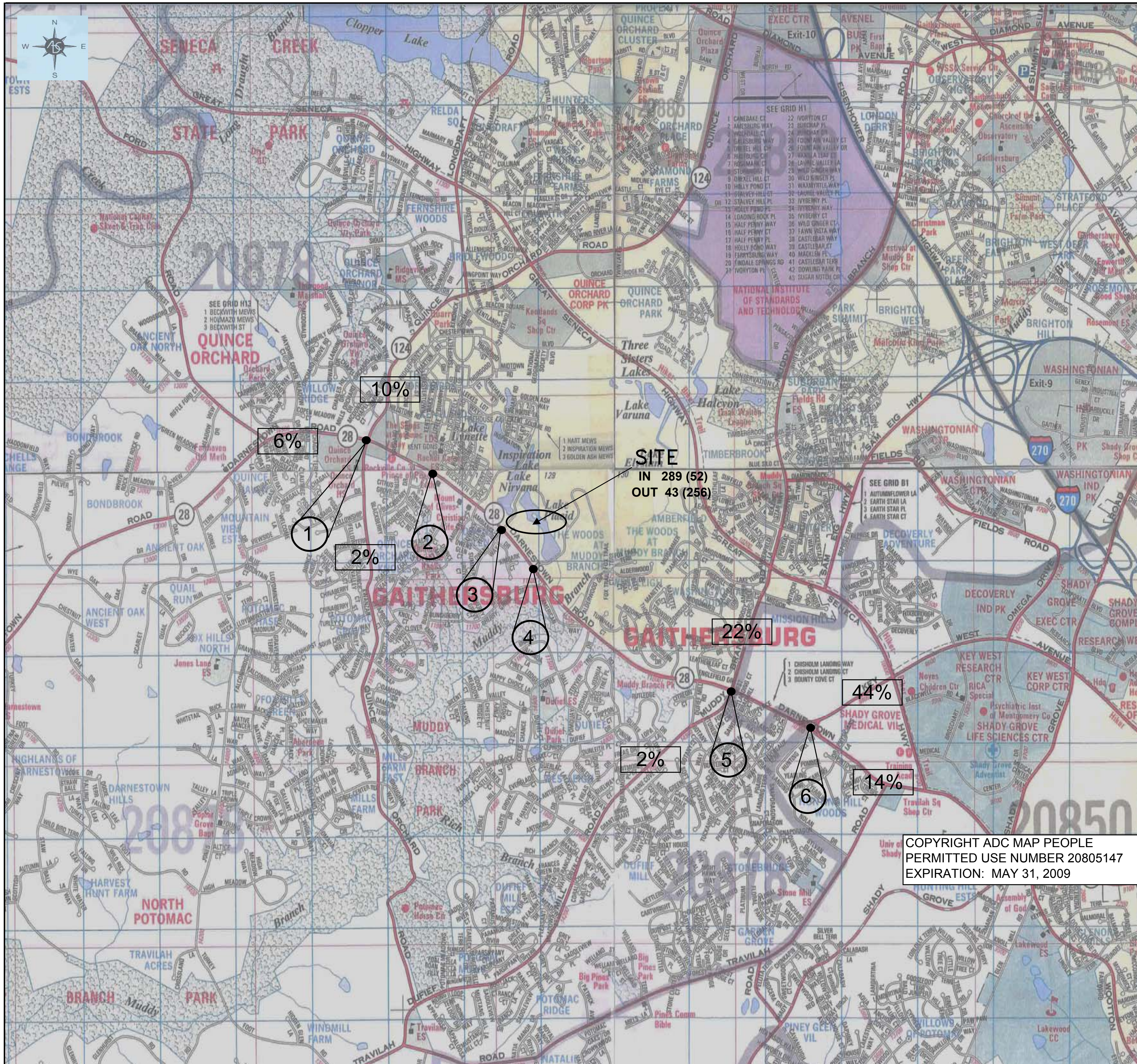
The "Highest and Best" Use includes full utilization of the office space, as included in the Background Condition, and continued use of the existing warehouse space. In addition, 200,000 SF of new office space would be built. Trip generation for this portion of the future site is based on LATR guidelines. Trip distribution and assignment is based on regional trip tables from the LATR and figures from the "GE Tech Park—Lot 1, Block 1 LATR Traffic Impact Analysis" and can be found in Figure 6. Capacity analysis worksheets for Future Condition 2 – "Highest and Best" Use – can be found in Appendix D. Volumes are shown on Figure 7. Table 5 below summarizes the results of the Future Condition 2 intersection capacity analyses.

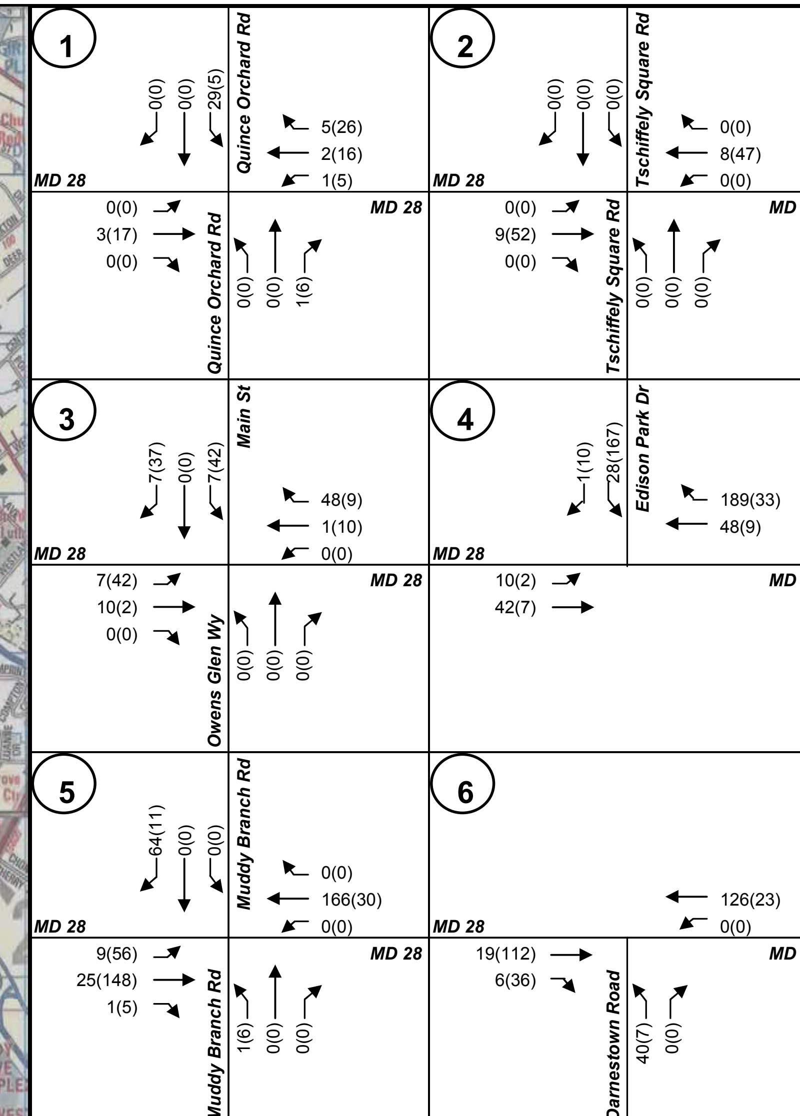
Table 5: Future 2 – "Highest and Best" Use -- Intersection Capacity Analysis

MD 28 at	AM Peak Hour Synchro				PM Peak Hour Synchro			
	Delay (sec/veh)	v/c	LOS	CLV	Delay (sec/veh)	v/c	LOS	CLV
Quince Orchard Road	**77.8**	0.96	**E**	1,187	**66.2**	0.96	**E**	1,424
Tschiffely Square Road	23.7	0.89	C	1,347	10.6	0.79	B	1,269
Owens Glen Way/ Main Street	15.6	0.87	B	1,289	29.4	0.83	C	1,147
Edison Park Drive (Unsignalized) [1]	**58.7**	0.70	**F**	1,269	**>999**	-	**F**	1,517
Muddy Branch Road	43.8	0.78	D	1,315	44.2	0.80	D	1,272
Darnestown Road	13.0	0.42	B	1,278	27.0	0.60	C	967

1- Delay, v/c, and LOS are reported for left-turns from the side street

Under the "Highest and Best" Use, MD 28 at Quince Orchard Road continues to operate at LOS E during both peak hours. Edison Park Drive deteriorates from a LOS E during the AM peak hour under Background Conditions to a LOS F. In addition the CLV threshold of 1,450 is exceeded at Edison Park Drive during the PM peak hour.





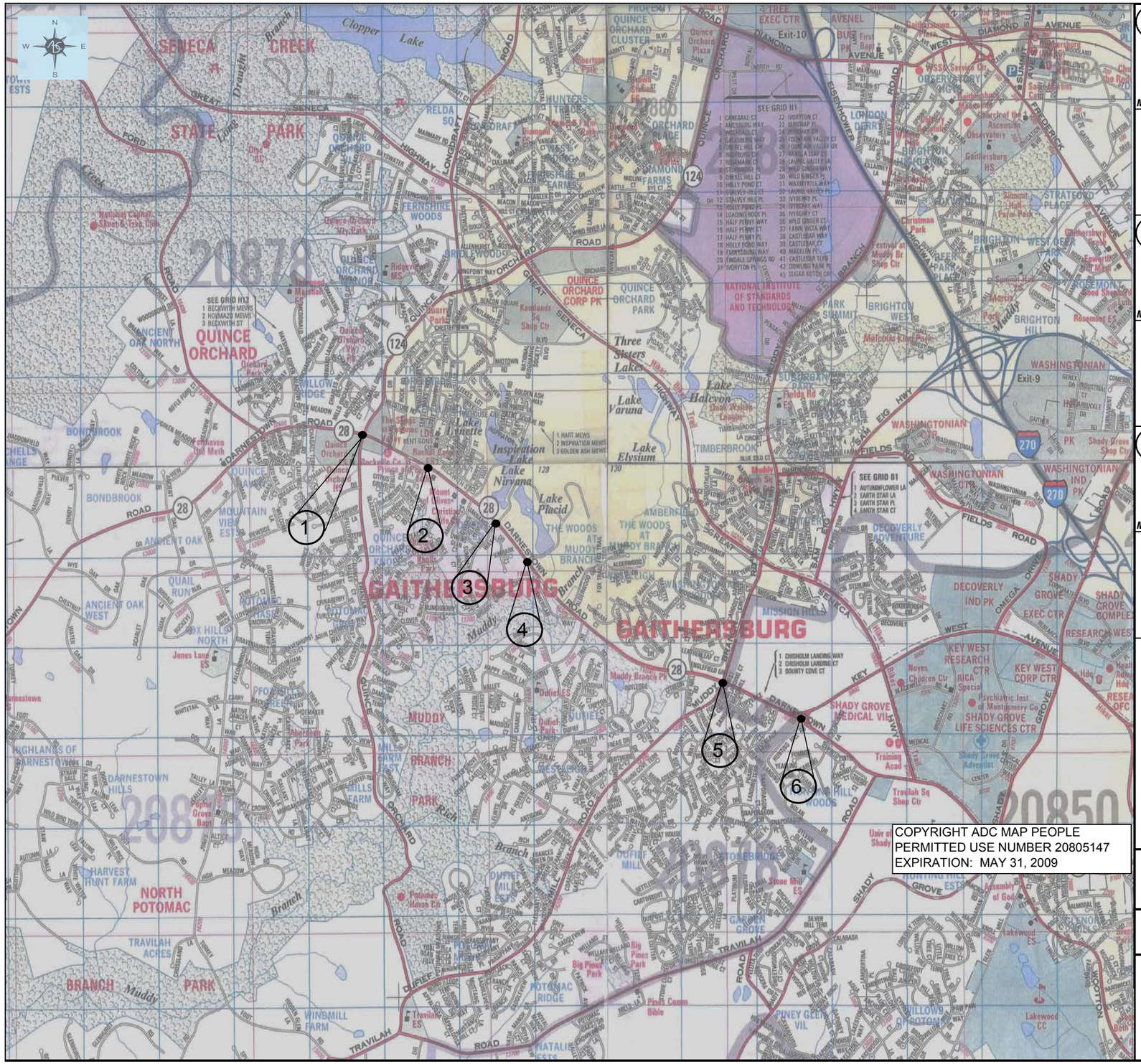
AM (PM) Peak Hour Traffic Volumes

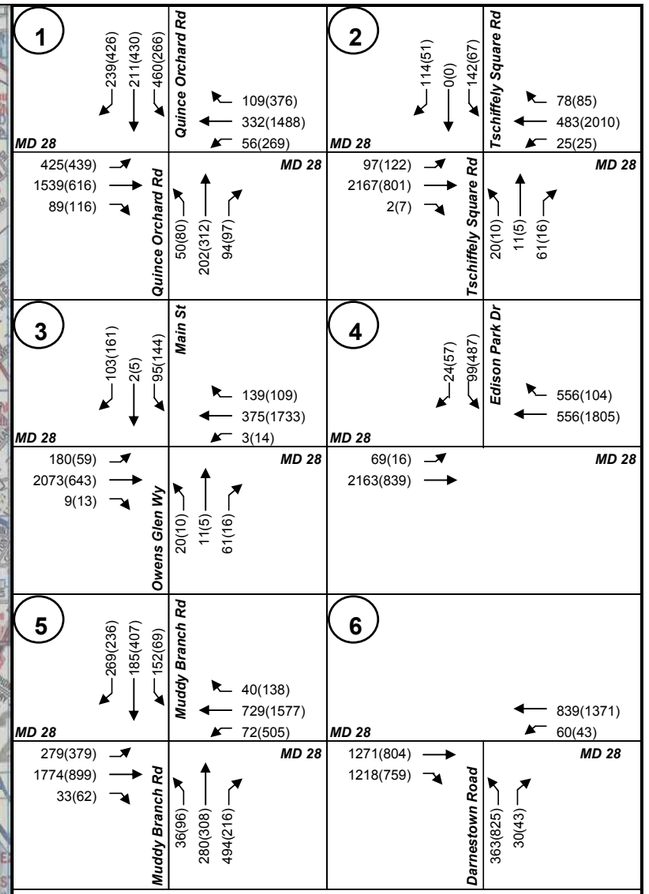
STV

GE Technology Park

Figure 6

Future 2 -- Highest and Best Use
Trip Assignment
AM and PM Peak Hour Traffic Volumes





AM (PM) Peak Hour Traffic Volumes

STV

GE Technology Park

Figure 7

Future 2 -- Highest and Best Use
AM and PM Peak Hour Traffic Volumes

VI. Truck Comparison

Aside from operational impacts to the surrounding intersections, truck traffic is of special significance due to the proximity of the warehouse to the neighboring homes along Still Creek Drive. In order to determine existing truck traffic to the site, three peak hour classification turning movement counts were conducted and two multi-day automated classification counts were conducted on-site. Future Condition 2 ("Highest and Best" Use) maintains the existing warehouse use. Therefore, truck traffic would not differ from existing conditions. In order to determine the projected truck traffic to the site for Future Condition 1 (Montgomery County Proposed Use) information from the DLC survey, as well as additional, more detailed, information from DLC officials was used. The specific information stated that:

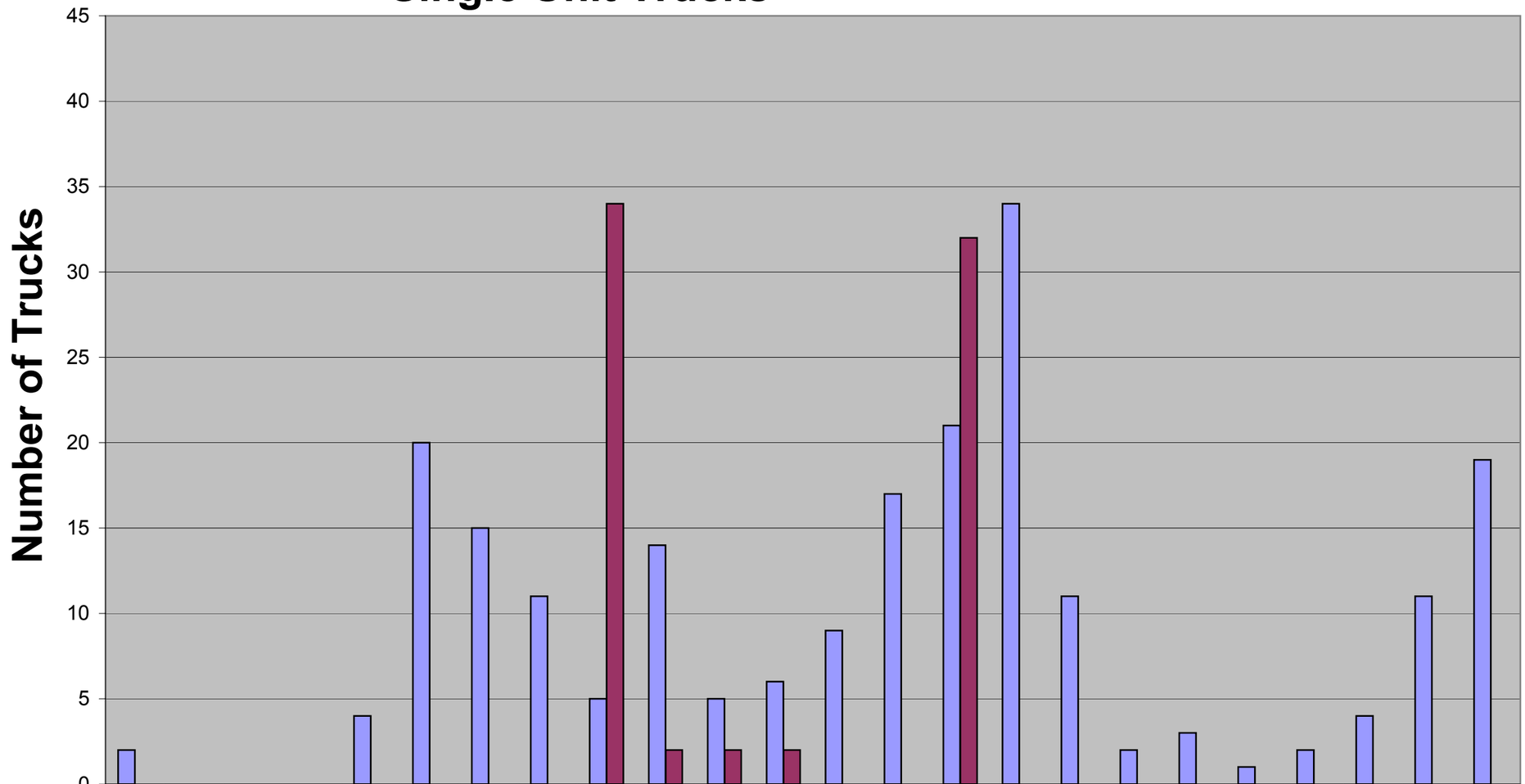
- There are 25 tractor trailer trucks in and out of the site each day. These trucks are distributed evenly over eight (8) hours between 8:00 AM and 4:00 PM, with three (3) in and three (3) out each hour.
- There are 32 light delivery trucks in and out of the site each day. These trucks all leave between 8:00 AM and 9:00 AM and return between 2:00 PM and 3:00 PM.
- There are four (4) smaller delivery trucks in and out of the site each day. These trucks are distributed evenly over four (4) hours between 8:00 AM and 12:00 PM, with one (1) in and one (1) out each hour.
- Trucks do not typically enter or leave the site outside of these hours.

Survey and count information can be found in Appendix E. A comparison of the truck traffic at the warehouse for Existing Conditions and for Future Condition 1 can be found in Figures 8, 9, and 10.

Based on the figures presented, it can be seen that the proposed truck traffic is less than half the existing truck traffic. Current nighttime truck traffic to and from the site (defined as between the hours of 11:00 PM and 7:00 AM) totals 66. There would be no truck traffic to and from the site during these hours under the County's proposed use. Additionally, Montgomery County's Proposed Use would include no truck traffic to or from the site on weekends, while current weekend counts show 271 total trucks to and from the site.

Hourly Truck Traffic: Existing vs. Montgomery County's Proposed Use
Single Unit Trucks

Daily Total
Existing - 216
Proposed - 72



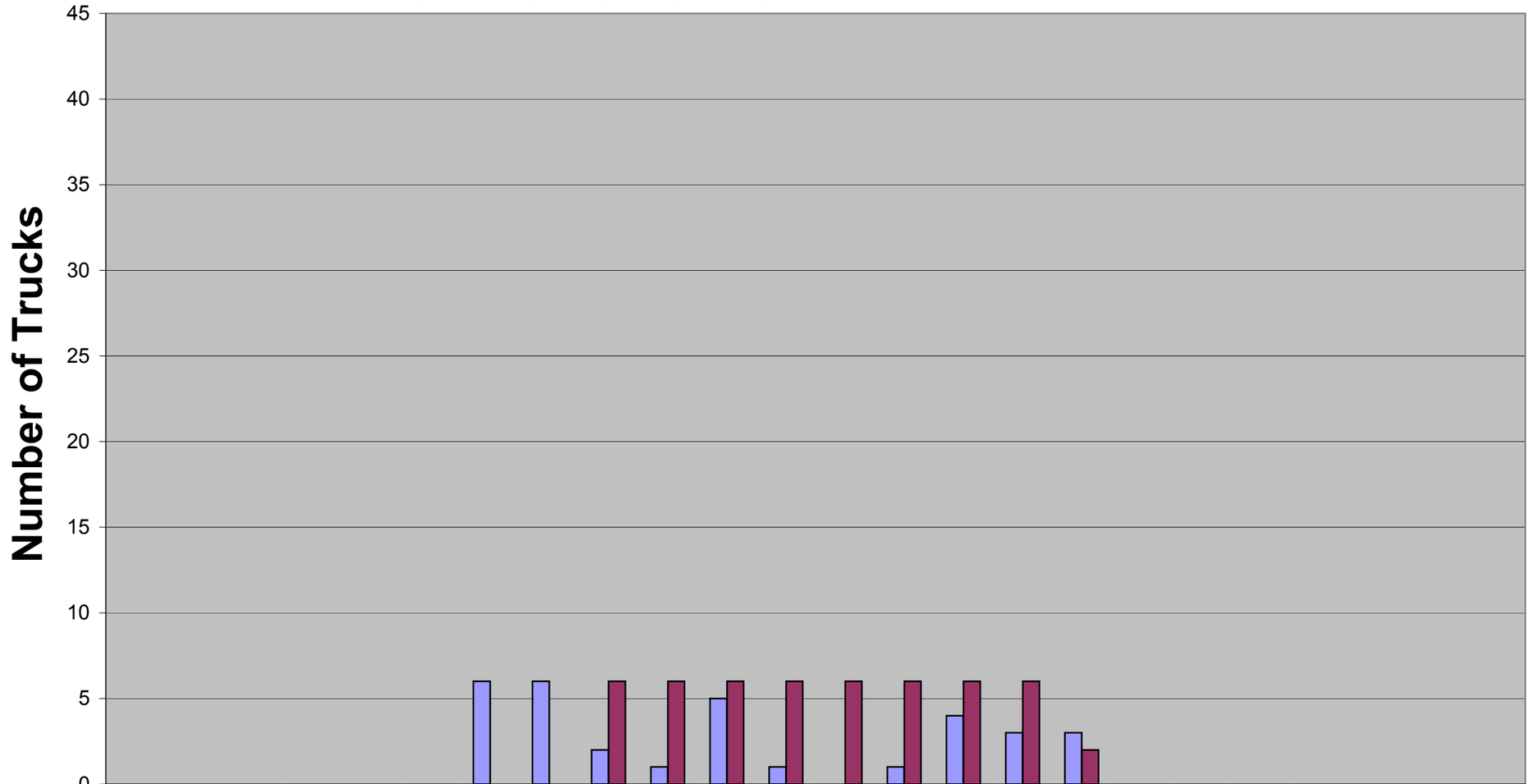
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
Existing Use	2	0	0	0	4	20	15	11	5	14	5	6	9	17	21	34	11	2	3	1	2	4	11	19
Montgomery County's Proposed Use	0	0	0	0	0	0	0	0	34	2	2	2	0	0	32	0	0	0	0	0	0	0	0	0

Hour Starting

Figure 8

Hourly Truck Traffic: Existing vs. Montgomery County's Proposed Use
Tractor Trailer Trucks

Daily Total
Existing - 32
Proposed - 50



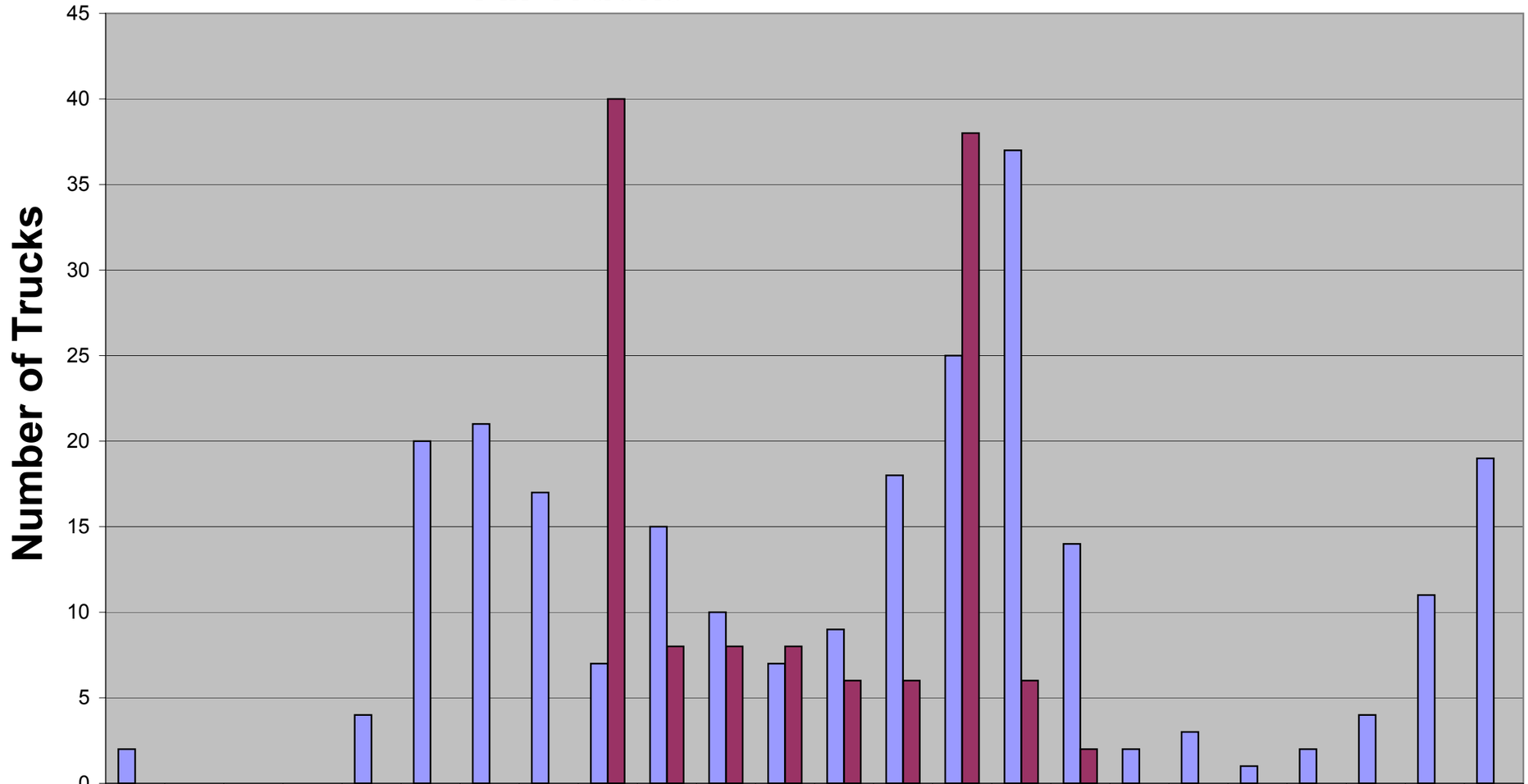
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
Existing Use	0	0	0	0	0	0	6	6	2	1	5	1	0	1	4	3	3	0	0	0	0	0	0	0
Montgomery County's Proposed Use	0	0	0	0	0	0	0	0	6	6	6	6	6	6	6	6	2	0	0	0	0	0	0	0

Hour Starting

Figure 9

Hourly Truck Traffic: Existing vs. Montgomery County's Proposed Use
All Trucks

Daily Total
Existing - 248
Proposed - 122



	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
Existing Use	2	0	0	0	4	20	21	17	7	15	10	7	9	18	25	37	14	2	3	1	2	4	11	19
Montgomery County's Proposed Use	0	0	0	0	0	0	0	0	40	8	8	8	6	6	38	6	2	0	0	0	0	0	0	0

Hour Starting

Figure 10

VII. Signal Warrant Analysis

A traffic signal warrant analysis was performed based on standards provided in the 2006 ***Md-MUTCD*** at MD 28 and Edison Park Drive. Since observed speeds along MD 28 were greater than 40 mph, the reduced requirements of the warrants are applicable. Edison Park Drive is wide enough for two approach lanes. Therefore, the warrant analysis was considered with the right turns removed.

The analysis also considered the full build-out of the existing GE Building. This correlates to the background condition evaluated previously. Since ITE's trip generation only provides peak hour data, driveway volumes were projected based on diurnal information for an existing office use to obtain the required 12 hours of information throughout the day. The full summary and analysis are located in Appendix F. A summary of the traffic volumes used for the analysis is presented below in Table 6.

Table 6: Volume by Hour for Signal Warrant Analysis

Time Period	From Edison Park Drive	From East MD 28	From West MD 28	Both MD 28 Approaches	Total Entering Volume
7:00 – 8:00	35	297	1,720	2,017	2,052
8:00 – 9:00	39	505	2,087	2,592	2,631
9:00 - 10:00	55	655	1,600	2,255	2,310
10:00 - 11:00	50	700	1,330	2,030	2,080
11:00 - 12:00	77	936	1,094	2,030	2,107
12:00 - 1:00	99	1,009	1,021	2,030	2,129
1:00 - 2:00	72	1,008	1,022	2,030	2,102
2:00 - 3:00	56	1,073	957	2,030	2,086
3:00 - 4:00	106	1,220	810	2,030	2,136
4:00 - 5:00	214	1,451	604	2,055	2,269
5:00 - 6:00	234	1,856	587	2,443	2,677
6:00 - 7:00	108	1,503	514	2,017	2,125

An evaluation of the intersection indicates that Warrants 1 and 2 are both met when considering the removal of right turns as well as the future traffic volumes associated with the unoccupied portion of the GE Building.

VIII. Conclusion

The existing GE Technology Park site contains 408,000 gross square feet of office space in the GE Building and approximately 260,000 square feet of warehouse space on the FINMARC Site. Montgomery County's proposed use includes office space for Police Administration, Fire Administration, Homeland Security, and the 1st District Police Station, as well as use of the warehouse by the Department of Liquor Control. For comparison purposes, a second proposed site use known as the ""Highest and Best" Use was considered in this study. The "Highest and Best" Use consists of full utilization of the existing office and warehouse facilities, and an additional 200,000 square feet of new office space.

Six intersections were analyzed along MD 28. MD 28 at Quince Orchard Road and Edison Park Drive both had an unacceptable LOS under Existing and Background conditions. Montgomery County's Proposed Use has a negligible impact on LOS, delay, v/c, and CLV. The "Highest and Best" Use, however, had a greater impact on LOS, delay, v/c, and CLV compared to Montgomery County's Proposed Use.

Aside from operational impacts to the surrounding intersections, truck traffic is of special significance due to the proximity of the warehouse to the neighboring homes along Still Creek Drive. For the Existing Condition truck volumes were obtained from classification counts. For Montgomery County's Proposed Use truck volumes were derived based on survey's and other information provided by the Department of Liquor Control which will be occupying the warehouse. Truck volumes based on Montgomery County's Proposed Use are less than half the existing truck volume. Current nighttime truck traffic to and from the site (defined as between the hours of 11:00 PM and 7:00 AM) is 66. There would be no truck traffic to and from the site during these hours under Montgomery County's proposed use. Additionally, there would be no truck traffic on weekends, while current weekend counts show 271 total trucks to and from the site.

A signal warrant analysis was conducted at the unsignalized site entrance and it was determined that warrants would be met under Background Conditions if the site were fully occupied. It would still be warranted based on the trips generated by the County's Proposed Use and the "Highest and Best" Use.